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North Carolina Senate President Pro Tempore Phil Berger
North Carolina House of Representatives Speaker Tim Moore
Co-Chairs, Joint Legislative Commission on Governmental Operations

Senator Shirley Randleman
Representative James Boles, Jr.
Representative Ted Davis
Co-Chairs, Joint Legislative Oversight Committee on Justice and Public Safety

North Carolina General Assembly
Raleigh, North Carolina 27601-1096

Re: State Crime Lab DNA report

Dear Senator Berger, Speaker Moore, and Members of the General Assembly:

Pursuant to applicable law, please find the attached report from the North Carolina Department of Justice on the NC Crime State Crime Laboratory's FY2016-17 operations and required statistics relating to the DNA Database and DNA databank.

Thank you for the opportunity to provide this information. We would be happy to respond to any questions you may have regarding this report.

Very truly yours,

Seth Dearmin
Chief of Staff

cc: Kristine Leggett, NCGA Fiscal Research Division

Traditional detective work will always be integral to law enforcement, but investigators increasingly rely on science and technology to solve crimes. DNA is one of the most important crime fighting tools of modern times because it can pinpoint suspects, convict the guilty, exonerate the innocent, and bring closure to victims and their families.

DNA, or deoxyribonucleic acid, is a unique genetic fingerprint found in cells of the human body. Just a tiny trace of the criminal's saliva or blood left behind can yield a DNA profile, which then can be compared to DNA samples from known criminals, arrestees or evidence from other crimes for a match.

DNA technology is perhaps most promising when used to solve crimes without an apparent suspect, such as a rape case where the victim cannot identify the attacker. Evidence collected can include a DNA sample left behind by the attacker, which can then be compared to millions of DNA profiles included in the state and national DNA database, called the CODIS system. If the comparison yields a match to an offender, the rapist can be identified and brought to justice.

The North Carolina State Crime Laboratory (NCSCL) uses DNA technology to help law enforcement solve crimes and bring justice to victims. The Lab's DNA Database unit screens, processes, and analyzes DNA samples from arrestees and convicted offenders and adds those DNA profiles to the database. In cases without a known suspect, a Lab analyst can compare a DNA profile developed from crime scene evidence to more than 320,000 DNA profiles in the Crime Lab's database to look for a match or hit to identify the suspect.

Once a hit is made, the NCSCL confirms it by re-analyzing the original DNA sample taken from the convicted offender or arrestee. The Lab also compares the thumbprint taken at the time the DNA sample was collected to the convicted offender's or arrestee's fingerprints on file to confirm that the identity of the person who provided the DNA sample. After this confirmation is complete, a search warrant is written and served on the convicted offender or arrestee to obtain another sample of DNA. This sample is analyzed to definitively confirm that the DNA matches.

Expanding North Carolina's DNA database—to include all convicted felons in 2003, certain arrestees in 2011, and additional arrestees in 2015—is succeeding with more hits to help solve crimes and aid investigations. To date the NCSCL has achieved more than 4,000 hits to the DNA database, including a record number of hits in Fiscal Year 2016-2017.

**During FY 2016-2017, the North Carolina State Crime Lab:**

- **Achieved 478 hits to the DNA database**, the highest number ever recorded in a single year. A hit is a match between a DNA profile in the database and DNA recovered from a crime scene. Since criminals, and especially rapists, often repeat their crimes, a database hit can crack a cold case.

- **Grew the state's DNA database to contain more than 320,000 DNA profiles** thanks to diligent work by the NCSCL and local and state law enforcement agencies. The more profiles the database contains, the more hits it is likely to yield to identify suspects, eliminate suspects and solve crimes. Data included in North Carolina's DNA database is included in the Federal Bureau of Investigations' national CODIS (Combined DNA Index System) database.

- **Partnered with the Forensic Science Advisory Board (FSAB) to review and update procedures and workflow.** The Forensic Science Advisory Board reviewed all the DNA Database procedures and recommended changes. These changes have been incorporated into procedures and implemented in the DNA Database. The FSAB also recommended workflow changes that streamlined sample processing. This improved efficiency has enable DNA Database samples to be more rapidly analyzed and uploaded into CODIS

- **Installed a new robotic instrument to process arrestee and convicted offender DNA samples** allowing quicker input of DNA into the database where it can be used to identify suspects.

## Summary of the Operations of the DNA Database Section for FY 2016-2017

**CODIS Hits for FY 2016-2017: 478**

- 355 hits to Convicted Offender DNA profiles
- 102 hits to Arrestees DNA profiles
- 21 hits to Forensic Samples, DNA profiles uploaded as a result of crime scene evidence analyzed by the NCSCL.

**Forensic Samples Uploaded: 1,350**

**Convicted Offenders Uploaded: 10,165**

**Arrestee Samples Uploaded: 9,212**
**Since February 1, 2011, more than 50,000 arrestee samples received*

## Trends from FY 11-12 through FY 16-17

| | FY11-12 | FY12-13 | FY13-14 | FY14-15 | FY15-16 | FY16-17 |
|---|---|---|---|---|---|---|
| Total CODIS hits: | 263 | 248 | 266 | 356 | 456 | 478 |
| Hits to arrestee DNA | 34 | 19 | 41 | 40 | 96 | 102 |
| Hits to Convicted Offender DNA | 229 | 220 | 218 | 285 | 345 | 355 |
| Hits to crime scene DNA | 0 | 9 | 7 | 31 | 15 | 21 |
| Forensic Samples Uploaded | 683 | 532 | 523 | 878 | 1,245 | 1,350 |
| Arrestee Samples Uploaded | 5170 | 3325 | 9419 | 7,210 | 8,047 | 9,212 |
| Convicted Offender Samples Uploaded | 7,202 | *19,183 | 14,471 | 10,366 | 13,103 | 10,165 |

CODIS=Combined DNA Index System, a nationwide DNA database;

**Numbers uploaded for FY2012-2013 were significantly higher due to the elimination of samples pending in that calendar year. In subsequent years, samples have been worked in the year in which they were submitted.*

## FY 2016-2017 DNA Database Expenses (Convicted Offender and Arrestee Samples)

| | |
|---|---|
| Staff Costs to Process DNA CODIS Samples | **$ 1,301,137** |
| Outsourced Laboratory expenses to process DNA CODIS Samples | **$ 14,515** |
| Other operating expenses (e.g. supplies) | **$ 705,943** |
| Total FY2015-2016 DNA Database Expenses | **$ 2,021,595** |

## Expunction of Arrestee DNA records

**DNA records from arrestees expunged in FY 2016-2017: 5,261**
**DNA expungements requested in FY 2016-2017: 7,564**

An important workload and associated programmatic costs of the DNA Database Section is the expungement or removal of arrestee samples upon request. FY 2015-16 saw a record number of requests for expungement as well as a record number of eligible expungements. Of the 7,564 expungements processed through completion in FY 2016-2017, 5,261 requests were approved and 2,303 were denied. As in prior years, the Database Section placed a number of requests on hold for final processing because no sample had been received for the specific arrest from the appropriate law enforcement unit.

### Expungement Procedure

As directed by State Crime Lab continues to follow its FBI-approved expungement procedure to remove qualifying arrestee DNA profiles from the database upon receipt of the Administrative Office of the Court (AOC) verification form as directed by G.S. 15A-266.3A. If the arrestee qualifies for expungement, the DNA samples is removed from the DNA database and destroyed. Also, the DNA record is removed from the DNA database and CODIS. Each person who submits a request for expungement is notified by letter whether or not his/her sample qualified for expungement.

### Arrestee/Convicted Offender Collection Kits

The Laboratory continues to provide the standardized Arrestee/Offender DNA collection kit; however, the kits are now ordered by law enforcement agencies directly through the State's vendor. Kits continue to be provided to law enforcement at no cost to the agencies. The kits will continue to be used specifically to collect DNA from certain convicted offenders and arrestees.

The Laboratory additionally continues to purchase 8,000 kits annually for the Department of Public Safety to facilitate standardized DNA collection in all state correction facilities.

Numerous DNA samples were rejected in FY 2015-2016 because they did not meet the statutory standards for collection pursuant to N.C.G.S. 15A-266.3A, which details offenses eligible for collection and inclusion in the DNA database. For example, a number of samples were submitted for failure to appear and for the service of a criminal summons, offenses for which arrestees are not required to provide DNA samples under NC law. The DNA Database Section continues to receive many duplicate samples for convicted offenders and arrestees whose samples are already present in the CODIS database.

Cont'd

**In FY2016-2017 approximately 5,200 of the 26,000 samples received were duplicates.** Over-submission of kits continues to impact the DNA Database Section. The Laboratory pays for the collection kits, which are provided to law enforcement agencies at no cost. To maximize taxpayer resources, the Lab encourages ongoing training in efficient collection procedures for submitting law enforcement agencies. All personnel involved in DNA sample collection are encouraged to complete training available on the North Carolina Justice Academy website to reduce duplicate sample submissions.

## Cutting Edge Technology and Equipment

New technology recently implemented at the NCSCL means arrestee and convicted offender DNA profiles are analyzed and uploaded to the database more rapidly. The NCSCL evaluated and began planning for in-house validation of a new chemistry kit using state-of-the-art capillary electrophoresis instrumentation in 2013. Two megaplex kits with the increased number of federally mandated core CODIS loci were evaluated and kit selection was made in the fall of 2014. The NCSCL completed validation in the summer of 2015 and analyst training in the fall of 2015. In October, 2015, the Database Section began using the Qiagen Universal BioRobot platform to analyze arrestee and convicted offender samples in-house eliminating the need to outsource the samples to a vendor laboratory. Using new technology to analyze convicted offender and arrestee DNA samples more efficiently in-house means these DNA profiles reach the database sooner to help solve crimes.

## ISO 17025

The Database Section received full accreditation under ISO 17025 in 2013. The ISO/IEC 17025 procedures are the highest international standards and protocols applicable to forensic science laboratories.

# ATTACHMENT I

## DNA COLLECTION: HOW IT WORKS

# DNA Collection Upon Arrest: How it works

DNA collection upon arrest saves lives, prevents violent crime by repeat offenders, saves investigative resources, improves ID procedures, reduces misidentification, reduces convictions based on false confessions, and clears cold cases.

## How it works in North Carolina:

- During certain felony arrests, law enforcement takes a DNA sample by cheek swab using a kit provided by the NC State Crime Laboratory (NCSCL)
- The cheek swab goes to the NCSCL, which logs the sample, verifies the eligibility of the sample, and then analyzes it to provide a DNA profile for upload to the database.
- That analysis is 100% quality assurance reviewed by a qualified NCSCL forensic analyst prior to entry into the DNA database as per federal requirements.
- The DNA profile is uploaded to state and national databases to search for matches to solve cold cases.

## NC State Crime Lab responsibilities:

Crime Lab scientists analyze crime scene evidence that may contain DNA. DNA profiles obtained from crime scene evidence are then run against the database of convicted offenders and arrestees to try to identify the perpetrator.

NCSCL staff receive each arrestee DNA sample, enter the sample data, verify the sample was taken from a suspect accused of a qualifying offense, analyze the sample, and upload it to the database of convicted offender and arrestee DNA.

When a search of the database yields a hit or matches between crime scene DNA and the DNA database, the NCSCL works with local law enforcement agencies to identify the suspect. Fingerprint collection is required in the DNA collection kit to help confirm identity.

If a person is permitted by court officials to expunge their DNA profile from the database (due to dismissal or acquittal or other qualifying event), the NCSCL removes it.

**Confirming a hit to the database: How it works:**

The CODIS State Administrator at NCSCL notifies the NCSCL Database Manager of a hit. The NCSCL Database Manager then starts the offender/arrestee confirmation process:

- Subject Information Assessment-- NCSCL verifies that the DNA profile is in the database due to a qualifying offense and that the offender/arrestee was not incarcerated at the time the offense under investigation was committed.

- Fingerprint verification — NCSCL analysts verify that the fingerprints submitted with the offender/arrestee DNA sample match those on file for the individual.

- Confirmation of offender/arrestee sample — DNA Database Analyst pulls the original offender/arrestee DNA sample and re-analyzes the sample to ensure that the profile matches what was uploaded to the database.

Once the confirmation process is completed, the Database Analyst notifies the NCSCL CODIS State Administrator. The CODIS Administrator then notifies the investigating law enforcement agency of the offender/arrestee's identity. This gives investigators probable cause to obtain a DNA standard from the individual to confirm the hit.

The investigating agency obtains a search warrant, often with SBI/NCSCL assistance, and obtains a DNA standard from the suspect which is then submitted to the NCSCL case analyst.

The NCSCL case analyst generates the profile for the DNA standard and compares this to the original crime scene evidence that was uploaded to CODIS. A case report is generated to confirm the match.

# ATTACHMENT II

# DNA FLOW CHART

# North Carolina State Crime Laboratory
# Forensic Biology and DNA Database Flow Chart